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THE PROGRESS OF SCIENCE

ENGINEERING EXPERIMENT
STATIONS IN THE LAND
GRANT COLLEGES

ON July 2, 1862, President Lincoln approved the act establishing the Land Grant Colleges of Agriculture and the Mechanic Arts, and on March 3, 1863, he approved the act incorporating the National Academy of Sciences. When the nation was stricken down with civil war it sought relief in science, on the one hand, establishing institutions for the scientific education of all the people in the arts of peace, on the other hand, recognizing exceptional merit in science and making the most distinguished men of the country the advisers of the government.

Now when the world is again infected by war more terrible than can be imagined in this one great nation which has escaped, we are naturally driven to think of "preparedness," and it will be well if this movement can be directed to making the nation strong through education and scientific research. At least three bills are before the Congress which are more important for the welfare of the country and its defense from foreign aggression, should that ever become necessary, than any enlargement of the army and navy. These bills would establish a national university, extend secondary education in industry and agriculture, and establish research stations for engineering at the colleges of agriculture and mechanic arts.

A national university at Washington, holding the same position toward the state and privately endowed universities as these hold or should hold to the colleges and schools of each state, would correspond with the establishment of the National Academy of Sciences during the civil war, but could be

made far more effective in its influence on research and on the efficient conduct of the departments of the government.

The Smith-Hughes bill provides for the promotion of the vocational education of boys and girls of high-school age through cooperation of the nation and the states. There is appropriated for the first year \$1,700,000 with an increment each year for eight years on condition that each cooperating state shall appropriate an equal sum. In the first year the sum of \$200,000 is for administration and investigation, \$500,000 for training teachers for vocational work, and \$1,000,000 for payment of teachers, equally divided between agriculture, on the one side, and trade, home economics and industry, on the other.

Of special interest to scientific men is the Newlands bill establishing research stations in engineering, corresponding to the existing agricultural stations in the colleges of agriculture and the mechanic arts. These land grant colleges and their agricultural research stations have been of incalculable value to education, to agriculture, to the states and to the nation. They have been largely responsible for the establishment and development of the state universities. The land grant colleges and the institutions of which they are a part received in 1914 from the United States \$2,500,000; from the states and from other sources over \$30,000,000. They have 9,000 instructors and 105,000 students.

By the Hatch act of 1887 and the Adams act of 1906 the sum of \$30,000 a year is appropriated for research in agriculture in the experiment stations. The colleges have more students of mechanic arts than of agriculture, but there is no similar provision for re-

search in the mechanic arts and engineering, and the sciences, such as physics and chemistry, on which they are based. The agricultural interests have always had great influence on legislation and in this case they have led the way. It is to be hoped that research in the engineering sciences will now be equally encouraged by the passage of the Newlands bill, which appropriates \$15,000 to each state and territory for conducting investigations in engineering and publishing the results.

Some scientific men may believe that more could be accomplished by the establishment of one great research laboratory or by granting the money only to institutions already distinguished for their contributions to science. There is, however, much to be said for initiating investigation in fifty widely scattered centers where work is already being done in agricultural science. It brings the value of research to the attention of the students of the college and the people of the state, and each station has the possibility of great development. In any case the passage of the bill as it stands is the most feasible method at present to extend research and will forward rather than interfere with other methods.

RESOLUTIONS OF THE COMMITTEE OF ONE HUNDRED

THE Committee of One Hundred on Scientific Research of the American Association for the Advancement of Science has given consideration to the Newlands bill and has passed the resolutions which follow:

WHEREAS the applications of science have made democracy possible by so decreasing the labor required from each that equal opportunity can be given to all;

WHEREAS in a democracy scientific research, which is for the general benefit and can not usually be sold to individuals, must be supported by the public;

WHEREAS a combination of national and state support and control is desirable in education and in research and its value has been fully proved by the

land grant colleges of agriculture and the mechanic arts, established in the states and territories by the Congress in 1862;

WHEREAS there is in connection with each of those colleges an agricultural experiment station to which the national government appropriates annually \$30,000 for agricultural research, the results of which have been of untold value to agriculture and to the nation;

WHEREAS experiment stations for the mechanic arts and engineering, including in their scope research in physics, chemistry and other sciences, would be of equal value to the nation and would repay manifold their cost, and

WHEREAS at the present time attention is directed to the need of preparation for every emergency, and this can best be accomplished by the advancement of science and the ability of our people to meet new conditions as they arise;

Resolved that the Committee of One Hundred on Scientific Research of the American Association for the Advancement of Science earnestly recommends the passage of the Senate Bill introduced by Mr. Newlands to establish experiment stations in engineering and in the other branches of the mechanic arts in connection with the colleges established by the Congress in the several states and territories, with an annual appropriation to each of \$15,000 for conducting investigations and experiments and printing and distributing the results; and further

Resolved that the committee urges each of the ten thousand members of the American Association for the Advancement of Science to use all proper efforts to bring the importance of the measure before members of the congress and to the attention of the public.

NATIONAL PRODUCTIVITY IN SCIENCE

As claimed in the preamble to the resolutions of the Committee of One Hundred, science can only flourish in a democracy if it is supported by the people. A democratic system is favorable to mechanical inventions for there are large numbers who have a common school education, who see the need and have the opportunity to devise improvements in their tools. In the cotton gin and the harvester, the sewing machine and the typewriter, the telegraph and the telephone, in the development of the